Engineering & Information Technology Entry-Level Competencies

Draft of Postsecondary Optimal Entry-Level Competencies
Curriculum Alignment Initiative
Missouri Department of Higher Education
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I Math

A. Use the x/y/z coordinate system to depict results of mathematical operations
B. Understand and apply the metric system
C. Demonstrate proficiency in defining and referencing ratios
D. Display skill in working with fractions
E. Utilize associative, commutative, and distributive properties
F. Simplify expressions using the order of operations
G. Distinguish between elements of the sets of real numbers
H. Distinguish between expressions, equations by type, and inequalities
I. Solve expressions, equations by type, and inequalities
J. Use graphs and number lines to depict results of equations and inequalities
K. Identify, solve, and label systems of equations
L. Use scientific notation to simplify exponential expressions
M. Employ polynomial operations and terminology correctly
N. Solve quadratic equations by factoring and quadratic methods
O. Perform standard operations with rational expressions
P. Perform standard operations with terms containing radicals
Q. Apply graphing skills to depict results of equations and inequalities
R. Use a calculator to perform basic mathematical operations

II Computer Literacy

A. Applications—demonstrate a standard proficiency in each of the following:
    1. Word processing
    2. Presentation graphics
    3. Spreadsheet
    4. Web browser
    5. E-mail client
    6. File transfer client
    7. Database fundamentals
B. Computer Savvy
    1. Recognize hardware devices by concept, features, and usage:
        a. Desktop computer—PC or Macintosh
        b. Printer—inkjet, laser, and dot-matrix

c. Scanner—by type and image quality
d. Digital camera—by image-capture type(still-shot / motion video)
e. MP3 player—by make and quality
f. Removable storage media – USB flash drives and optical discs

2. Apply existing knowledge when learning new technologies
3. Demonstrate or develop basic troubleshooting skills
4. Identify basic networking concepts for local- and wide-area networks
5. Demonstrate basics for computer security and safe computer use

C. Computer Language Basics
1. Identify prominent languages by type and usage
2. Explain in basic terms how language compilers and interpreters function
3. Describe basic concepts in logical program flow and control structures
4. Demonstrate a basic understanding of variables and language syntax
5. Show basic programming skills by successfully writing and running a simple program

D. Operating Systems Skills
1. Use operating system features and functions
2. Manage the operating system via graphical and command-line user interfaces
3. Distinguish between file formats by type and related application
4. Demonstrate skill with file management
5. Explain basic interaction between applications and their parent operating systems

III Communication Skills

A. Demonstrate comprehension skills in written, verbal, and graphic information structures
B. Interact / collaborate / publish with peers, experts, and others through varied digital environments and media types
C. Communicate ideas effectively via a variety of media and formats
D. Contribute to project teams to produce and deliver original works or to solve problems
E. Develop and demonstrate global cultural understanding and awareness by communicating with learners from non-native cultures
F. Identify and explain how computers affect interaction in local society and between cultures

IV Professionalism

A. Positive Work Ethic
1. Provide proof of punctual and reliable conduct
2. Employ a positive mental attitude
3. Demonstrate honesty in all actions

B. Personal and Professional Ethics
1. Embrace and exhibit honesty in personal and professional environments
2. Understand and follow legal standards applicable to IT
3. Understand and follow IT business accountability standards
4. Acknowledge and abide by legal and ethical standards regarding intellectual property

C. Digital Citizenship
    1. Understand human, cultural, and societal issues related to technology
    2. Advocate and practice safe, legal, and responsible information and technology use
    3. Exhibit a positive attitude for collaboration, learning, and productivity via technology
    4. Demonstrate personal responsibility for lifelong learning

V Research and Information Gathering Skills

A. Search Engine Usage
    1. Employ effective querying skills
    2. Demonstrate how to search within results
    3. Show how to store and consult search results
B. Leveraging Digital Tools
    1. Plan strategies to guide inquiry
    2. Gather, organize, analyze, synthesize, and use information from media sources
    3. Consider and select appropriate methods for information delivery